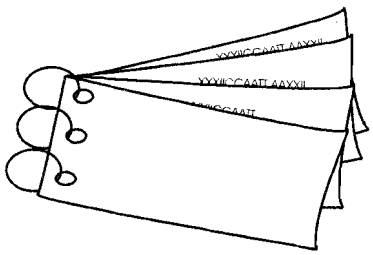

UNIT 6 FOOD STORAGE

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- Correct storage helps to prevent spoilage, contamination and wastage. It is necessary to maintain the wholesome and nutritional quality of the food and is also essential in the safe and hygienic operation of any food business.
- Adequate storage conditions are determined by perishability of a food.
- Foods can be categorized as perishable, semi-perishable and shelf-stable/ non- perishable foods. Perishable foods must be held under refrigerated conditions in order to keep 2 to 30 days. Under refrigeration semi-perishable foods may last from 30 to 90 days. Foods in the shelf-stable category last from 90 days to three years depending on the process/ packaging system used and their storage environment.

6.1 Inspection of Food Upon Receipt

- Food should be inspected as soon as it is received and prior to using, storing or reselling it.
- All deliveries should be checked for freshness, temperature, colour, odour, contamination, infestations and satisfactory packaging, and labeling. Any problems should be reported.
- As far as practicable, external packaging should not be brought into food preparation areas.

- Food should be accepted only if it satisfies the following conditions:
  1. The food was prepared by and received from an approved source.
  2. The food is in a wholesome condition.
  3. The food is in containers that are not damaged.
  4. The food or containers are not contaminated with insects, rodents, or other vermin.
  5. Perishable foods are delivered within temperature requirements. [Hot food 60^{0}C (140 degrees F) or above, cold foods 50^{0}C (41 degrees F) or below]
  6. Frozen foods have no visible signs of thawing and refreezing (i.e. frost or ice crystals on boxes or food).
  7. Shell eggs are clean and unbroken.
  8. Raw or raw frozen molluscan shellfish containers are properly labeled with the species, quantity, harvest site, date of harvest and name and certification number of the harvester or original shipper or both. (Keep labels for at least 90 days.)

6.2 Types of Food Storage

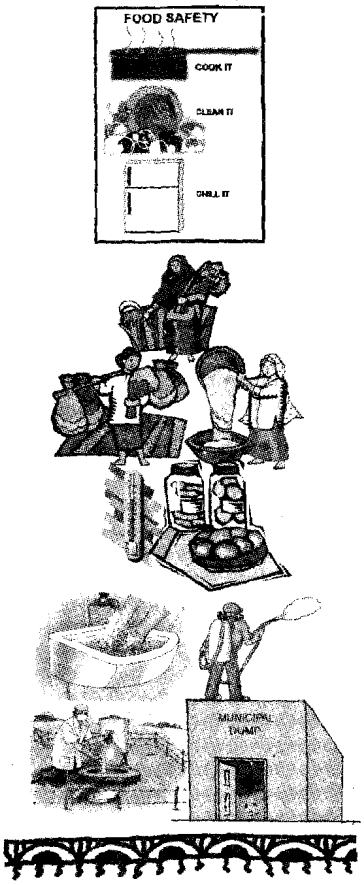
- Storage conditions should ensure that the nutritive value, appearance, taste and fitness of the food are maintained.
- The three major storage areas to hold large stocks or for bulk supplies are: Dry food storage for non-perishables; refrigerated storage for semi-perishables and freezer storage for perishables.
- The conditions of food storage include the following:

Type of Storage	Conditions
1. Dry Storage	Store rooms should be cool, dry, clean, well lighted and well ventilated; food items should be kept in containers that cannot be damaged by possible pest infestation.
2. Refrigerated Storage	Includes refrigerators, walk - in chiller, cold room, refrigerated display cabinets; relative humidity needs to be controlled. Correct storage required to minimize possibility of food – borne illness and cross- contamination; refrigerated storage temperatures vary from product to product.
3. Freezer Storage	Includes commercial deep-freezing cabinets, walk - in freezers, open top display freezers, blast freezers and frozen storage. Compartment of

(Table contd.)

	refrigerator; relationship between time and temperature determines food quality; sound packaging important to prevent drying out and getting freezer-burn.
4. Hot storage	Internal temperature of food should be maintained at 60 ^{0}C (140^{0} F) or above during preparation and transport

6.3 Essential Features of Food Storage Areas



Some of the essential features that must be present in food storage areas are as follows:

1. All lights shall be shielded. This includes walk-in coolers and other refrigeration units. This will protect food, utensils and equipment from glass fragments should a bulb break. It shall be required to provide effective shielding devices for all lights in food preparation, food utensil storage, and utensil washing areas.

2. In order to protect foods and containers from splash and flooding, storage areas shall be equipped with racks, pallets, and shelves to elevate products six inches above the floor. Food storage materials shall be made of non-absorbent, easily cleanable surfaces.

3. Contact paper is not acceptable because it is not durable or long lasting. It adds an additional interface for the accumulation of debris.

4. All equipment and utensils shall be so durable under normal conditions and operations as to be resistant to: denting, buckling, pitting, chipping and excessive wear, and shall be capable of withstanding repeated scrubbing, scouring, and the corrosive action of cleaning and sanitizing agents.

5. Food contact surfaces of equipment and utensils shall be smooth, free of breaks, open seams, cracks, chips, pits and similar imperfections. All food contact surfaces of equipment and utensils shall be free of corners and/or crevices that are too difficult to clean internally.

6. All food contact surfaces, unless designed for in-place cleaning, shall be accessible for manual cleaning and inspection without disassembly, without tool use for disassembly, or disassembly by the use of simple tools (available at the equipment) such as a mallet, screwdriver, or an open-end wrench.

7. Equipment, which is placed on tables or counters and is not readily removable, shall be sealed thereto or mounted on legs/feet at least four inches high. Also, the equipment shall be installed so that both the surrounding and adjacent areas are readily available for cleaning.

8. Floor-mounted equipment, unless readily movable, shall be sealed to the floor or shall be installed on raised platforms of concrete or other smooth

masonry at least six inches above the floor, and in such a manner as to prevent liquids or debris from accumulating in spaces not fully open for cleaning and inspection. The space between adjoining units, and adjacent walls shall be closed, unless exposed to seepage. Then, sufficient space shall be provided to facilitate easy cleaning between, behind and beside all such equipment.

6.4 High Risk Foods and their Storage

- High risk foods are those perishable foods that can support the growth of harmful bacteria. Consumers may also eat them without further treatment such as cooking that would destroy such organisms.
- The risky foods that could be potentially hazardous include cooked meats and food containing meat, dairy products and foods containing dairy products, sea food and food containing sea food, prepared fruits and vegetables, cooked rice and pasta, cooked or processed foods containing protein-rich food, garlic or herbs, gravies and sauces.
- Bacterial growth in potentially hazardous foods can be limited by adherence to the following time- temperature control processes:

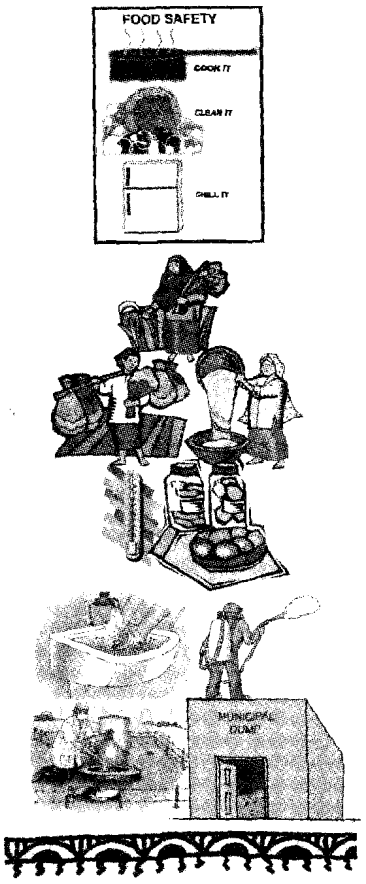
1. Cooked meats and food containing meat, such as sliced meats, smoked meat, poultry or fish, curries and meat pies;
2. Dairy products and foods containing dairy products, such as milk, cream, custard, baked goods containing cream or custard, soft cheeses (although they can be allowed to ripen at room temperature for a few hours) and dairy-based desserts;
3. Seafood (excluding live seafood) and food containing seafood, such as seafood salad, fish cakes, cooked fish or shellfish;
4. Prepared fruits and vegetables, such as prepared salads, cooked vegetables, cut melon, sprouted seeds and ready-to-eat fruit packs;
5. Cooked rice, pasta dishes and fresh pasta;
6. Cooked or processed foods containing eggs, beans, or other protein-rich food, e.g. hard boiled eggs, soyabean products such as soy milk, bean curd or fresh bean noodles;
7. Vegetables, garlic or fresh herbs in oil where a food acid does not appear on the ingredient list;
8. Gravies and sauces; and
9. Foods that contain any of the above foods, such as sandwiches and salads.

6.5 Food Display

The main principle to be considered in the display of food is to protect the food from contamination by customers, staff and the environment.

Precautions

- High risk hot foods (e.g. pies and cooked chicken) must be kept above 71°C (158°F).
- High risk cold foods (e.g. filled-rolls, sandwiches, cooked meats and salads) must be kept below 5°C (41°F).
- Customers, staff, etc. must protect all unwrapped food usually eaten in the same state as it is sold, from possible contamination by flies and dust.
- Tongs or other serving utensils must be provided for staff, and for customers when food is sold by self-selection.
- Tickets or labels must not be placed in contact with any unwrapped food.
- Milk must be stored away from daylight and must be kept refrigerated at 7°C (45°F) or less.
- All meat and fish on display must be kept out of direct sunlight.
- Raw fish on display should be kept at 7°C (45°F) or less.
- Raw meat on display should be kept at 13°C (55°F) or less.
- Raw meat and fish pre-wrapped for customer selection must be kept at 2°C (36°F) or less.
- Raw meat and fish in short-term bulk storage must be kept at 2°C (36°F) or less.
- Thawed frozen food for sale must be labeled as having been previously frozen.
- Frozen food on display must be kept at -17°C (1°F) or below.
- Frozen food in bulk storage must be kept at -18°C (0°F) or below.



6.6 General Storage Guidelines

- Store food and supplies in their specific designated areas.
- Keep storage areas clean and dry.
- Keep potentially hazardous foods (PHF) out of the Temperature Danger Zone 5°C to 60°C (41°F to 140°F).
- Use first in, first out (FIFO) when storing food.
- Food should be dated when it is received and prepared.
- Label food with its expiration date.
- If there is any question about a product's storage or expiration, discard it.

6.7 Stock. Rotation

- Satisfactory rotation of stock, to ensure that older food is used first, is essential to avoid spoilage and applies to all types of food.
- Daily checks should be made on short-life perishable food stored in fridges, while weekly checks of other foods may do.
- Good stock rotation has the added advantage of helping to maintain the correct levels of stock.
- Stock rotation has been made easier with the onset of date marking, but some products don't require a "use-by" date and in these cases, food handlers must use their own coding system.
- Remember - First in, First out.

IF in DOUBT—THROW it OUT

6.8 Guidelines for Dry Storage, Refrigeration Storage and Freezer Storage

- Dry Storage Guidelines
- Refrigeration Storage Guidelines
- Freezer Storage Guidelines

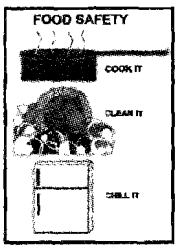
Dry Storage Guidelines

- Store food at least 6 inches off the floor and away from walls.
- Store food in the original packages or in containers that prevent product damage.
- Keep the storeroom clean.

Refrigeration Storage Guidelines

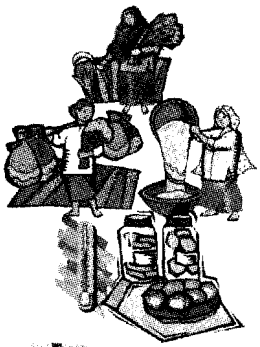
- Use open shelving - this improves air circulation.
- Monitor food temperatures and the temperature of the refrigerator.
- To hold food at 5°C (41°F) or less, the refrigerator temperature must be 3°C (38°F).
- Do not overload the refrigerator.
- Store raw products (meat, poultry and fish) separately from (or below) cooked or ready-to-eat foods.
- Hot food should not be put directly into the fridge, as this will raise the temperature of food already being stored and will encourage condensation and consequently contamination.
- Put prepared food in shallow containers to ensure quick heat loss.
- Refrigerate food as soon as it has cooled after cooking or processing.

- Don't pack foods tightly together, but leave space between containers for the cold air to circulate.
- Food should be covered to prevent drying out, cross-contamination and possible taints .

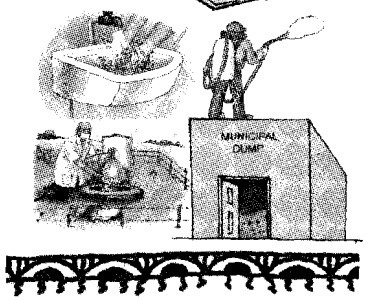


- Use leftovers within 24 hours.
- The refrigerator door should be open for the least possible time.
- Refrigerators need regular cleaning and maintenance for best performance.

· *Freezer Storage Guidelines*



- Place frozen food in the freezer as soon as received and inspected.
- Store food in the original container or tightly wrap to prevent freezer damage.
- Keep the freezer at -17°C (0°F) or below.
- Quick frozen foods should be sold only from freezer cabinets designed for the purpose that are capable of keeping the food at a constant temperature of -12°C taken just below the load line.



- Food products must not be stacked above the load line.
- Unless put in bulk storage, new stock should be put in the freezer cabinets immediately on delivery.
- Don't refreeze thawed or partly thawed food.
- Freezer cabinets should be sited away from draughts and direct sunlight.
- To ensure efficient operation freezers must be kept clean and should be defrosted regularly.

Storage tips for specific food classes are discussed in the complete Unit. Look it up for details on storing meats, poultry, eggs, fish products, dairy products, fruits and nuts, vegetables, canned foods, grains, seasonings, coffee and tea, fats and oils, water.

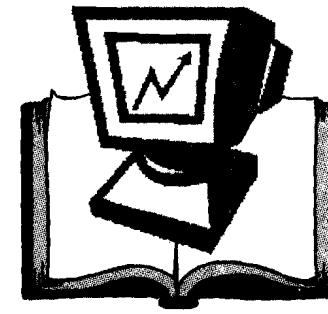
Key Terms

Cross contamination: Contamination of a food from another food or surface which is in close contact with it.

Potentially hazardous foods: Easily spoiled foods known to harbour dangerous microbes.

Temperature danger zone: Temperature range which is ideal for the growth of dangerous microbes.

PLEASE COMPLETE "CHECK YOUR PROGRESS EXERCISES" GIVEN IN THIS UNIT IN THE ONLINE VERSION FOR ASSESSING YOUR OWN PROGRESS.



YOU MUST REMEMBER TO STUDY THE COMPLETE UNITS GIVEN BOTH ONLINE AND ON CD-ROM. THEY MAY CONTAIN FURTHER DETAILS NOT GIVEN IN THIS SUMMARY VERSION. THE EXAMINATIONS WILL TEST YOU ON THE COMPLETE UNITS NOT ON THE SUMMARY VERSION.